

**CITY OF BOULDER
CITY COUNCIL AGENDA ITEM**

MEETING DATE: November 10, 2009

AGENDA TITLE:

Consideration of a motion accepting the Fourmile Canyon Creek and Wonderland Creek Major Drainageway Planning Phase A Report as modified by the staff recommendations

PRESENTER/S:

Jane S. Brautigam, City Manager
Paul J. Fetherston, Deputy City Manager
Maureen Rait, Executive Director of Public Works
Ned Williams, Director of Public Works for Utilities
Bob Harberg, Utilities Planning and Project Management Coordinator
Annie Noble, Greenways Coordinator
Kurt Bauer, Engineering Project Manager

EXECUTIVE SUMMARY:

The purpose of this agenda item is to present final staff recommendations on the Fourmile Canyon Creek and Wonderland Creek flood mitigation planning effort and request a motion for acceptance of the Fourmile Canyon Creek and Wonderland Creek Major Drainageway Planning Phase A Report as modified by the staff recommendations.

The Major Drainageway Phase A Report, prepared by Love and Associates in June 2007, developed, evaluated, and recommended flood mitigation conceptual-level alternatives along both Wonderland and Fourmile Canyon creeks. The work was jointly sponsored by the Urban Drainage and Flood Control District and the city. This evaluation provides a long-range plan that can be used to prioritize capital improvement projects in the context of the overall flood Capital Improvement Program (CIP), as well as provide information that allows staff, private property owners and the development community to plan and coordinate activities in recognition of the flood hazards and potential mitigation strategies.

At the April 28, 2009 city council study session, council expressed general support for the plan but requested that the mitigation cost of containing the high hazard flows versus containing the 100-year event flows be re-evaluated and presented such that final recommendations for each stream reach could be considered.

The report recommendations have been reviewed through an extensive public involvement process. Based on feedback from the public process and the Water Resources Advisory Board, staff believes there is now general concurrence on the flood mitigation approach for all stream reaches. No stream reaches are recommended for a 100-year flood containment project unless substantial outside funding is provided (probably by federal grants). See **Table 2** for a summary of the staff recommendations.

STAFF RECOMMENDATION:

The Fourmile Canyon and Wonderland Creek Major Drainageway Flood Mitigation Plan is intended to serve as a guide for long-range planning. This plan will be used to:

- Prioritize capital improvement projects in the context of the overall flood Capital Improvement Program (CIP),
- Provide information that allows staff, private property owners and the development community to plan and coordinate activities in recognition of the flood hazards and potential mitigation strategies,
- Support the city's efforts to secure grant money, and
- Secure private funds from developers during redevelopment projects.

Funding for planning, design and construction of the proposed mitigation measures would be based on this long-range plan, but would be evaluated and refined through the city's Community and Environmental Assessment Process (CEAP) and CIP processes. As a result, staff recommends the plan provide enough flexibility to further evaluate all ranges of alternatives without precluding the ability to secure outside funding.

Staff requests council consideration of this matter and action in the form of the following motion:

Motion to accept the Fourmile Canyon Creek and Wonderland Creek Phase A Plan as modified by staff as a long-term plan with the understanding that funding for flood mitigation improvements for each stream reach will be evaluated as part of the city's CEAP and CIP processes. Staff modifications to the Phase A study include:

1. Wonderland Creek from 26th Street to Foothills Parkway – High Hazard Containment unless substantial outside funding can be secured for 100-year Containment
2. Wonderland Creek from 19th Street to 26th Street – High Hazard Containment with safe access to Crestview Elementary School via 19th Street
3. Fourmile Canyon Creek from 7th Street to 28th Street – High Hazard Containment with safe access to Crestview Elementary School via 19th Street and Upland Avenue
4. Fourmile Canyon Creek from 28th Street to Pleasant View Soccer Fields – No recommendation (stream reach located in Boulder County)
5. Fourmile Canyon Creek from BNSF Railroad to Boulder Creek - No recommendation (stream reach located in Boulder County)

COMMUNITY SUSTAINABILITY ASSESSMENTS AND IMPACTS:

- Economic: Removing areas from flood hazards reduces the amount of resources required to provide emergency preparedness and emergency response activities. Repair of flood damaged public infrastructure serving private properties located within flood hazard areas can be costly. In addition, a significant flood event could have a major impact on government provided social services like housing and counseling.
- Environmental: Flood mitigation measures provide the opportunity to reduce the potential for erosion along existing channels and incorporate water quality and habitat enhancement features into the mitigation design.
- Social: Flood mitigation measures along Fourmile Canyon Creek and Wonderland Creek would reduce flood hazards for all residents regardless of their social demographics. Flood mitigation would reduce the flood related hazards for vulnerable populations.

OTHER IMPACTS:

- Fiscal: The recommended improvements for both Fourmile Canyon Creek and Wonderland Creek total approximately \$17.5 million in public expenditures. Mitigation measures would be prioritized with other city flood mitigation requirements and implemented in phases when funding becomes available. Staff will also seek outside funding for flood mitigation efforts.
- Staff time: The staff time to implement recommended flood mitigation measures is included in normal work plans.

BOARD AND COMMISSION FEEDBACK:

This study has gone through extensive public process. **Attachment 1** presents a chronology of the process along with motions from the most recent meetings. Staff presented staff analysis to WRAB on Aug. 17 and Sept. 21, 2009. During the September meeting, staff recommended WRAB approve the Fourmile Canyon Creek and Wonderland Creek Phase A Report with staff modifications, including a modified 100-year containment alternative for Wonderland Creek between 26th Street and Foothills Parkway. WRAB passed a motion recommending City Council adopt the Phase A Report as modified by staff and subject to the condition that if a significant portion of grant funding is not awarded to construct various segments of the project, then WRAB recommends adopting only the High Hazard Containment and Floodproofing alternative for the segment of Wonderland Creek between 26th and Foothills Parkway. Motion passed by vote of 4:1 (S. Iott opposed, favors the high hazard containment option only.)

PUBLIC FEEDBACK:

This study has gone through extensive public process. **Attachment 1** presents a chronology of the public process. An open house was held on Aug. 5, 2009 to solicit public input on flood mitigation measures for Wonderland Creek between Foothills Parkway and 26th Street. Seventeen people attended the open house and nine written comments were received. Frequently heard comments included:

- Flood insurance has been a burden and this cost should be considered
- The public's willingness to floodproof their residences is questionable

BACKGROUND:

The Major Drainageway Phase A Plan, prepared by Love and Associates in June 2007, developed, evaluated, and recommended flood mitigation conceptual-level alternatives along both Wonderland and Fourmile Canyon creeks. A broad range of alternatives were evaluated for each of the 18 reaches of Fourmile Canyon Creek and Wonderland Creek. Estimates of probable construction cost, maintenance requirements, residual flood damage estimates, and a benefit/cost analysis was developed for each alternative.

This evaluation provides a long-range plan that can be used to prioritize capital improvement projects in the context of the overall flood Capital Improvement Program (CIP) and provides information that allows staff, private property owners and the development community to plan and coordinate activities in recognition of the flood hazards and potential mitigation strategies.

The public process has resulted in revisions to the Phase A recommendations for seven of the 18 stream reaches along both Fourmile Canyon Creek and Wonderland Creek. In addition, staff is no longer making flood mitigation recommendations for stream reaches located entirely outside city limits. **Table 1** presents a summary of these modifications.

One of the reasons for changes in mitigation recommendations is concern over safe access to Crestview Elementary School. Crestview Elementary School is located between Fourmile Canyon Creek and Wonderland Creek. Under existing conditions, a major storm event would result in flooding of roadways to depths that would likely be unsafe for vehicular access to the school. Staff has coordinated with the Boulder Valley School District to help develop a flood emergency plan (shelter in place and evacuation depending on conditions) for Crestview Elementary School. Staff is also recommending the flood mitigation plan include crossing and channel upgrades that would result in safe access to the school along 19th Street at both Wonderland and Fourmile Canyon Creeks as well as at Upland Ave. at Fourmile Canyon Creek.

Table 1: Summary of Changes to Phase A Study

Stream Reach	Reach ID	Phase A Recommendation	Revised Recommendation
Wonderland Creek			
■ Wonderland Lake to Broadway	8	Maintain Existing	No revisions
■ Broadway to 19 th Street	7	Maintain Existing	Safe Access to Crestview Elementary School via 19 th Street ²
■ 19 th Street to 26 th Street	6	HHZ Containment / Floodproofing	HHZ Containment / Floodproofing ¹
■ 26 th Street to 28 th Street	5	100-year Containment	HHZ Containment / Floodproofing unless substantial outside funding is provided for 100-year Containment
■ 28 th Street to Diagonal Hwy	4	100-year Containment	
■ Diagonal Hwy to Foothills Parkway	3	HHZ Containment / Floodproofing	
■ Foothills Parkway to Valmont Road	2	Floodproofing	No revisions
■ Valmont to Goose Creek	1	Maintain Existing	No revisions
Fourmile Canyon Creek			
■ City limits to Lee Hill Drive	6c	Maintain Existing	No revisions
■ Lee Hill Drive to 7 th Street	6b	HHZ Containment / Floodproofing	No revisions
■ 7 th Street to Broadway	6a	Floodproofing	HHZ Containment / Floodproofing
■ Broadway to Violet Avenue	5	HHZ Containment / Floodproofing	No revisions
■ Violet Avenue to 26 th Street	4	100-year Containment	HHZ Containment with Safe Access to Crestview Elementary School via 19 th Street and Upland Avenue ²
■ 26 th Street to 28 th Street	3	HHZ Containment / Floodproofing	No revisions
■ 28 th Street to 30 th Street	2b	100-year Containment	No recommendation (reach in Boulder County)
■ 30 th Street to Pleasant View Soccer Fields	2a	Maintain Existing	No recommendation (reach in Boulder County)
■ Pleasant View Soccer Fields to BNSF Railroad	1b	Maintain Existing	No revisions
■ BNSF Railroad to Boulder Creek	1a	HHZ Containment / Floodproofing	No recommendation (reach in Boulder County)

¹ Revised method for high hazard zone (HHZ) containment that reduces the estimated cost by approximately \$600,000 from Phase A HHZ containment alternative

² Channel modifications at 19th Street required to provide safe access to Crestview Elementary School

ANALYSIS:

Flood mitigation recommendations presented to WRAB, Planning Board and City Council during 2008 and 2009 ranged from maintaining existing conditions to containing the 100-year flood. Based on feedback from the public process, staff believes there is general concurrence on mitigation of high hazard flood risk. The only reaches located within the city where staff considered flood improvements greater than mitigating for high hazard was along Wonderland Creek between 26th Street and Foothills Parkway. In this area the following two approaches were considered:

1. Containment of the entire 100-year flood flows at public expense, thus mitigating all potential property damage due to the 100-year storm event
2. Containment of the high hazard flood zone at public expense, coupled with voluntary private financing of floodproofing private property owner's structures.

The 2009 WRAB recommendation would require that significant outside funding (most likely from the Federal government) be made available prior to implementing 100-year containment. Without significant grant funding, WRAB recommends that the city fund only that portion of the project's costs needed to secure high hazard containment for the segment of Wonderland Creek between 26th Street and Foothills Parkway.

Staff concurs with this recommendation and will pursue outside funding. One major source of funding is the Federal Emergency Management Agency (FEMA) Hazard Mitigation grant program. FEMA awards hazard mitigation grants up to \$3 million per project. In order to be eligible for the FEMA grant, proposed mitigation projects must have a benefit-to-cost ratio greater than 1.0.

The following items present policy, planning goals and other rationale supporting the expenditure of public funds on flood mitigation that goes beyond protection of life and safety.

1. A Boulder Valley Comprehensive Plan policy states the city will protect the public and property from the devastating impacts of flooding in a timely and cost-effective manner. The Phase A report indicates high benefit-to-cost (B/C) ratios for the 100-year containment alternative for certain reaches along Wonderland Creek. However, the B/C ratios will need to be confirmed through the federal grant application process.
2. The recommendation is supported by the basic policy of the Urban Drainage and Flood Control District that the major drainage system should be capable of conveying water without flooding buildings during the 100-year flood.
3. A mitigation strategy goal in the city's Multi-Hazard Mitigation Plan is to reduce vulnerability of people, property and the environment to natural hazards with particular emphasis on new and existing buildings and infrastructure.
4. Removing areas from flood hazard reduces the amount of resources required to provide emergency preparedness and emergency response activities.
5. Repair of flood damaged public infrastructure serving private properties located within flood hazard areas can be costly.

6. A significant flood event could have a major impact on government provided social services like housing and counseling.
7. Private property damage affects the community as a whole by potentially lowering property values, sales taxes and property taxes and impacting home purchasing or business location decisions.
8. The spill from Fourmile Canyon Creek was not recognized until the late 1990s. The resulting increase in downstream flood hazard has increased flood insurance rates for many structures located along Wonderland Creek.

Table 2 presents a summary of recommended alternatives for all reaches along both Fourmile Canyon Creek and Wonderland Creek, with this information shown on a map as **Attachment 2**. Changes to recommendations as presented to City Council in 2008 are indicated by italicized font.

Table 2: Summary of All Recommended Alternatives for Fourmile Canyon Creek and Wonderland Creek

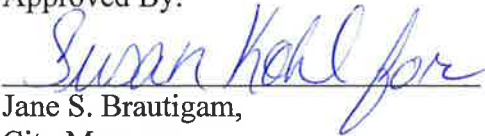
Stream Reach	Recommendation	Estimated Public Cost (\$ million) ¹
Wonderland Creek		
■ Wonderland Lake to Broadway	Maintain existing conditions	\$0
■ <i>Broadway to 19th Street</i>	<i>Channel Modifications upstream of 19th Street</i>	\$0.2
■ 19 th Street to 26 th Street	High Hazard Containment ²	\$0.9
■ <i>26th Street to Foothills Parkway</i>	<i>High Hazard Containment unless substantial outside funding is available for 100-Year Containment²</i>	<i>\$9.5³</i>
■ Foothills Parkway to Goose Creek	Maintain existing conditions	\$0
Total for Wonderland:		\$10.6
Fourmile Canyon Creek		
■ City limits to Lee Hill Drive	Maintain existing conditions	\$0
■ Lee Hill Drive to 7 th Street	High Hazard Containment	\$0.1
■ 7 th Street to Broadway	High Hazard Containment ²	\$2.4
■ Broadway to 28 th Street	High Hazard Containment ²	\$4.4
■ <i>28th Street to Pleasant View Soccer Fields</i>	<i>No recommendation (reach in Boulder County)</i>	\$0
■ Pleasant View Soccer Fields to BNSF Railroad	Maintain existing conditions	\$0
■ <i>BNSF Railroad to Boulder Creek</i>	<i>No recommendation (reach in Boulder County)</i>	\$0
Total for Fourmile Canyon:		\$6.9
Grand Total:		\$17.5

¹ Does not include maintenance costs

² Recommendations modified by staff from Phase A Report

³ Cost reflects HHZ Containment alternative (100-year Containment estimated to cost \$16 million)

Approved By:


Jane S. Brautigam,
City Manager

ATTACHMENTS:

Attachment 1: Public Process Chronology and Summary of City Advisory Board and Council Motions

Attachment 2: Map of Recommended Alternatives

ATTACHMENT 1
Public Process Chronology
and
Summary of City Advisory Board and Council Motions

Fourmile Canyon and Wonderland Creek Flood Mapping and Mitigation Planning Chronology

1981-1987 - Original Flood Mapping and Mitigation Studies by Greenhorne and O'Mara

1981 – Flood Mapping Study and Letter of Map Revision by Greenhorne & O'Mara
1984 – Urban Drainage and Flood Control District (UDFCD) Flood Mapping and Major Drainageway Planning - Phase A – Alternatives Analysis by Greenhorne and O'Mara
1987 - Urban Drainage and Flood Control District (UDFCD) Major Drainageway Planning - Phase B – Preliminary Design by Greenhorne and O'Mara

1987 - 1997 – City of Boulder and Boulder County Implement Flood Management Program Consistent with Greenhorne & O'Mara Mapping and Mitigation Studies

1997 – 1999 – Identification of Fourmile Canyon Creek Flood Mapping Problem and New Flood Mapping Study by Love & Associates

1997 - Problems with existing Fourmile Canyon Creek flood maps first identified as part of Foothills Housing site development proposal (west of Broadway and south of Fourmile Canyon Creek)

February 11, 1999 – City Council Information Item regarding Fourmile Canyon Creek flood mapping problems

May 18, 1999 – Draft Fourmile Canyon Creek flood mapping study by Love & Associates

June 1, 1999 – City Council Agenda Item and consideration of approaches to deal with the Fourmile Canyon Creek flood mapping problems

August 2, 1999 – Public Meeting regarding Fourmile Canyon Creek Flood Mapping Problem and New Flood Mapping Study by Love & Associates

September 13, 1999 – Public Meeting regarding Fourmile Canyon Creek Flood Mapping Problem and New Flood Mapping Study by Love & Associates

1999-2000 - Fourmile Canyon Creek Major Drainageway Planning - Phase A – Alternatives Analysis by Love & Associates

June 1999 – UDFCD and the city initiated the Fourmile Canyon Creek Major Drainageway Planning - Phase A – Alternatives Analysis

July 15, 1999 – City Council Information Item regarding the Phase A – Alternatives Analysis project

September 29, 1999 – City Council Information Item regarding the Phase A – Alternatives Analysis project by Love & Associates

January 18, 2000 – Independent Review Panel (IRP) meeting regarding the Phase A Alternatives Analysis project by Love & Associates

January 28, 2000 – Independent Review Panel (IRP) meeting regarding the Phase A Alternatives Analysis project by Love & Associates

March 8, 2000 – IRP meeting regarding the Phase A Alternatives Analysis project by Love & Associates

March 10, 2000 – Draft Fourmile Canyon Creek Major Drainageway Planning – Phase A Report by Love & Associates

March 15, 2000 – City Council Information Item regarding Fourmile Canyon and Wonderland Creeks Flood Mapping project

April 10, 2000 – Public Meeting regarding Fourmile Canyon Creek and related North Boulder flood hazard mitigation alternatives

April 24, 2000 – IRP meeting regarding the Phase A Alternatives Analysis project by Love & Associates

May 2, 2000 – IRP opinion and recommendations regarding the Phase A Alternatives Analysis project by Love & Associates

June 9, 2000 – Final Fourmile Canyon Creek Major Drainageway Planning – Phase A Report released by Love & Associates

July 10, 2000 - Transportation Advisory Board consideration of the Fourmile Canyon Creek and related North Boulder flood hazard mitigation alternatives

July 17, 2000 - Water Resources Advisory Board consideration of the Fourmile Canyon Creek and related North Boulder flood hazard mitigation alternatives

July 24, 2000 - Parks and Recreation Advisory Board consideration of the Fourmile Canyon Creek and related North Boulder flood hazard mitigation alternatives

July 26, 2000 - Open Space Board of Trustees consideration of the Fourmile Canyon Creek and related North Boulder flood hazard mitigation alternatives

August 27, 2000 – IRP meeting regarding the Phase A Alternatives Analysis project by Love & Associates

September 27, 2000 – Public Meeting regarding Fourmile Canyon Creek and related North Boulder flood hazard mitigation alternatives

September 28, 2000 - Planning Board consideration of the Fourmile Canyon Creek and related North Boulder flood hazard mitigation alternatives

October 17, 2000 – City Council consideration of the Fourmile Canyon Creek and related North Boulder flood hazard mitigation alternatives

October 18, 2000 – Public Meeting regarding Fourmile Canyon Creek and related North Boulder flood hazard mitigation alternatives

2001-2002 - Fourmile Canyon Creek Major Drainageway Planning - Phase B– Preliminary Design by Love & Associates

March 7, 2001 – Draft Selected Plan for the Fourmile Canyon Creek Major Drainageway Planning Study released by the UDFCD and the city, Fourmile Canyon Creek Major Drainageway Planning - Phase B - Preliminary Design by Love & Associates initiated

May 3, 2001 - City Council Information Item regarding Fourmile Canyon Creek Flood Mitigation Planning

October 10, 2001 - City Council Information Item regarding Fourmile Canyon Creek Flood Mitigation Planning

November 2001 – Draft Fourmile Canyon Creek Major Drainageway Planning – Phase B Report released by Love & Associates

February 1, 2002 - City Council Information Item regarding Fourmile Canyon Creek Flood Mitigation Planning

March 13, 2002 – Public meeting regarding Fourmile Canyon Creek Flood Mitigation Planning

March 21, 2002 – IRP Meeting regarding Fourmile Canyon Creek Flood Mitigation Planning

April 10, 2002 – WRAB Information Item regarding Fourmile Canyon Creek Flood Mitigation

June 26, 2002 - City Council Information Item regarding Fourmile Canyon Creek Flood Mitigation Planning

November 21, 2002 – IRP Meeting regarding Fourmile Canyon Creek Flood Mitigation Planning, South Boulder Creek Flood Mapping Study and the CFS Master Plan

May 2002 – Love & Associates commissioned to supplement Fourmile Canyon Creek and Wonderland Creek flood mitigation alternatives based on IRP recommendations and other public input

2003-2009 - Fourmile Canyon and Wonderland Creeks Flood Mapping and Mitigation Studies

March 21, 2003 – IRP Meeting regarding Fourmile Canyon and Wonderland Creeks Flood Mitigation Planning

February 26, 2003 – IRP Meeting regarding Fourmile Canyon and Wonderland Creeks Flood Mitigation Planning

April 2003 – High resolution aerial photos taken by Merrick & Company

2003 - UDFCD and the city initiated the Fourmile Canyon and Wonderland Creeks flood mapping and mitigation studies by Love & Associates

2004 - High resolution aerial photos and digital terrain model completed by Merrick & Company

May 2005 – Draft Fourmile Canyon and Wonderland Creeks flood mapping study completed by Love & Associates

July 2005 - Direct mailing notification of affected property owners

July 20, 2005 – Public meeting regarding the draft Fourmile Canyon and Wonderland Creeks flood mapping study completed by Love & Associates

August 15, 2005 - Water Resources Advisory Board (WRAB) review and recommendation regarding Fourmile Canyon and Wonderland Creeks flood mapping study submittal to FEMA

October 2005 – Newsletter mailed to property owners with updated information regarding Fourmile Canyon and Wonderland Creeks flood mapping study submittal to FEMA

November 17, 2005 - Planning Board review and recommendation regarding Fourmile Canyon and Wonderland Creeks flood mapping study submittal to FEMA

December 20, 2005 - City Council review and recommendation regarding Fourmile

Canyon and Wonderland Creeks flood mapping study submittal to FEMA

March 2006 – City submits Fourmile Canyon and Wonderland Creeks flood mapping study to FEMA for review

March 2007 – FEMA approves and adopts Fourmile Canyon and Wonderland Creeks flood mapping study submitted by the City

June 2007 – Final Fourmile Canyon / Wonderland Creek Flood Mitigation Report by Love & Associates

September 19, 2007 – Greenways Advisory Board meeting regarding Fourmile Canyon / Wonderland Creek Flood Mitigation Report by Love & Associates

September 27, 2007 - Public meeting regarding Fourmile Canyon / Wonderland Creek Flood Mitigation Report by Love & Associates

October 15, 2007 - Water Resources Advisory Board (WRAB) discussion of Fourmile Canyon / Wonderland Creek Flood Mitigation Report by Love & Associates

December 17, 2007 - Water Resources Advisory Board (WRAB) discussion of Fourmile Canyon / Wonderland Creek Flood Mitigation Report by Love & Associates

January 8, 2008 - Water Resources Advisory Board (WRAB) discussion of Fourmile Canyon / Wonderland Creek Flood Mitigation Report by Love & Associates

February 21, 2008 – Planning Board discussion of Fourmile Canyon / Wonderland Creek Flood Mitigation Report by Love & Associates

March 18, 2008 – Public meeting regarding Fourmile Canyon / Wonderland Creek Flood Mitigation Report by Love & Associates

March 20, 2008 – Planning Board discussion of Fourmile Canyon / Wonderland Creek Flood Mitigation Report by Love & Associates

November 10, 2008 – Public Hearing and City Council discussion of Fourmile Canyon / Wonderland Creek Flood Mitigation Report by Love and Associates and Staff Recommendations

April 28, 2009 – City Council Study Session regarding Flood Management and Fourmile Canyon / Wonderland Creek Flood Mitigation Issues

August 5, 2009 – public open house to solicit input on flood mitigation alternatives for Wonderland Creek between 26th Street and Foothills Parkway

August 17 and September 21, 2009 – Water Resources Advisory Board (WRAB) discussions of mitigation alternatives for Wonderland Creek between 26th Street and Foothills Parkway

Meeting Motions 2008 - 2009

January 2008 WRAB passed a motion with a 4-0 vote to recommend approval of the Phase A plan as modified by staff with the following recommendations and guiding principles:

1. Protect life safety by addressing structures in the high hazard zone through:
 - a) Acquiring properties from willing sellers
 - b) Constructing flood improvements at time of redevelopment of properties along Fourmile Canyon Creek west of Broadway and Wonderland Creek near 30th.
 - c) Constructing high hazard zone containment and other improvements as funding is available, including coordinating with the county on expediting improvements located jointly in the city and county.
2. The intent of the overall approach is to minimize disruption to private property and riparian areas. This implies that flooding during 100-year events will not be contained in a channel minimizing impacts to downstream properties. Many properties including schools will experience shallow flooding under this approach.
3. During the next phase all potentially impacted properties and persons including students and parents should be notified of proposed approach and tradeoffs of minimizing property impacts versus the potential for flood damages.
4. Public education of flood risks should be emphasized including signage and flood markers and response plans for impacted schools.
5. Opportunities for facilitating and encouraging private flood proofing should be explored.
6. Continue to maintain high level of public involvement and feedback.
7. This non-structural approach requires active regulatory flood plain management in order to preserve flood conveyance areas.

In March 2008 Planning Board passed a motion recommending City Council accept the proposed flood mitigation plan outlined in the March 20, 2008 staff memorandum including the following recommendations:

1. City Council approve the staff's recommendation with prioritization, to the extent feasible from an engineering perspective, favoring city improvements over county improvements.
2. Public education on life and safety issues as to flooding, particularly as to critical facilities, be given a high priority.
3. Discussion with the affected property owners in the Village Center take place with the feasibility of moving forward with flood mitigation.

The motion passed 5-1, A. Sopher opposed. The dissenting vote from Sopher was based on his request that the report contain additional physical flood protection for access and egress to Crestview Elementary and Waldorf Elementary school.

On November 10, 2008 Council members discussed the Fourmile Canyon and Wonderland Creek Flood Mitigation Plan. Council expressed concern about moving

forward on such a complex and costly project and stated the need for taking more time in making this decision. Prior to making its decision, Council requested the following:

- A field trip to the affected properties
- A study session that would focus on the policy level
- That the Water Resources Advisory Board and staff review the overall spending for water utilities and provide that information for Council

On April 28, 2009 staff presented information to City Council during a Study Session to address issues raised during the November 2008 public hearing. Council members generally expressed support for the approach to flood mitigation planning and that existing policies were appropriate, with the following comments relating to the Phase A report:

1. The current approach to flood mitigation should continue and is mostly in the right direction.
2. Consider doing the least amount of work necessary with the structural improvement approach to mitigate flood hazards.
3. Flood mitigation work proposed along Fourmile Canyon Creek east of 28th should be reconsidered and possibly scaled back.
4. Alternatives that leave drainageways in their natural state should be a priority.
5. Mitigation measures should be kept as "green" as possible, i.e. minimize use of asphalt and concrete.
6. The need to disturb natural areas for the benefit of a few homes was questioned.
7. Flood mitigation to reduce the 100-year floodplain was questioned if the mitigation was only to reduce property damage. Focus removal efforts on structures in the high hazard and conveyance zone.
8. City council members requested that proposed mitigation costs be presented to distinguish the cost of containing high hazard flood flows versus containing all 100-year flood flows.

Staff presented to WRAB on August 17, 2009 and on September 21, 2009. During the September meeting, staff recommended WRAB approve the Fourmile Canyon Creek and Wonderland Creek Phase A Report with the staff modifications including a Modified 100-year Containment alternative for Wonderland Creek between 26th and Foothills Parkway.

On September 21, 2009 WRAB passed a motion recommending City Council adopt the Phase A Report as modified by staff and subject to the condition that if a significant portion of grant funding is not awarded to construct various segments of the project, then WRAB recommends adopting only the High Hazard Containment and Floodproofing alternative for the segment of Wonderland Creek between 26th and Foothills Parkway. Motion passed by vote of 4:1 (S. Iott opposed, favors the high hazard containment option only.)

Attachment 2: Summary of Recommendations

